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of an intelligence capable of progress, appeared almost simultaneously."

In another work, entitled Origin of Speech, Noiré has developed this hypothesis. His book was reviewed by Max Müller, who regarded this view as too exclusive, yet that it was far superior to either the onomatopœia or the interjection theory, and that it was certainly the best and most probable one brought forward at present.

Whether this hypothesis seems plausible or not, would not a comparative study of the physiology of the vocal organs, and of the connection between the brain and the faculty of speech throw light on this problem? May not the power of speech have been a differentiation of the musical power, and have originated from the play of the intenser emotions or passions rather than from the mechanical movements of the arms or legs in labor?

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RECENT LITERATURE.

THIRD ANNUAL REPORT OF THE U. S. GEOLOGICAL SURVEY.[1]—Succeeding the director's report and those of the chiefs of divisions, are the papers accompanying, and which constitute the main portion of the volume. These are: Birds with teeth, by Professor O. C. Marsh; The copper-bearing rocks of Lake Superior, by R. S. Irving; Sketch of the geological history of Lake Lahontan, by Israel C. Russell; Abstract of the report on the geology of the Eureka district, Nevada, by Arnold Hague; Preliminary paper on the terminal moraine of the second glacial epoch, by T. C. Chamberlain; and a review of the non-marine fossil Mollusca of North America, by C. A. White, M.D.

All of these papers are carefully prepared and elaborately illustrated. In his article on birds with teeth, Professor Marsh concludes that the fact that the three oldest known birds should differ so widely from each other, points unmistakably to a great antiquity for the class. Archæopteryx, Hesperornis and Ichthyornis are all true birds; but the reptilian characters they possess are convergent toward a more generalized type. No Triassic birds are known, and hence we have no light on this stage of the development of the class. They will doubtless be found, however, and if we may judge from Jurassic mammals and reptiles, the next classes above and below birds, the avian forms of that period would still be birds, although with even stronger reptilian features. "For the primal forms of the bird-type, we must evidently look to the Palæozoic; and in the rich land-fauna of our American Permian we may yet hope to find the remains of both birds and mammals."

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[1] *Third Annual Report of the U. S. Geological Survey to the Secretary of the Interior, 1881–'82.* By J. W. POWELL, Director. Washington, 1883. Royal 8vo, pp. 564.

Professor Marsh then enumerates the characters we should expect to find in the ancestral type of birds, the more essential characters being a free quadrate bone, since this is a universal feature in birds, and only partially retained in the Dinosaurs now known. "The birds would appear to have branched off by a single stem, which gradually lost the reptilian characters as it assumed the ornithic type, and in the existing Ratitæ we have the survivors of this direct line. The lineal descendants of this primal stock doubtless early attained feathers and warm blood, but, as already shown, never acquired the power of flight. The volant birds doubtless separated early from the main avian stem, probably in the Triassic, since, in the formation above, we have Archæopteryx with imperfect powers of flight."

In his sketch of the geological history of Lake Lahontan, Mr. Russell describes the topography of the Quaternary lake of that name which lay in what is now Northwestern Nevada, and is now represented by Pyramid and other lakes in Nevada, and Honey lake in California. This system of great lakes, as it seems to have been, was comparable in number and magnitude with the present lakes of the St. Lawrence basin. "At the time New England and a number of the Northern States were covered with an immense mer-de-glace, and the lofty peaks of the Rocky mountains, the Sierra Nevada and a few of the intermediate ranges gave birth to local glaciers, the ratio of precipitation to evaporation throughout the Greatbasin was so great as to give rise to a great number of lakes, whose combined surface must have formed a large per centage of the total area of the region. Twenty-one of these ancient lakes, of which Lake Bonneville and Lake Lahontan are the mostinteresting, have already been explored in the northern part of the basin, and at least three of some magnitude are known to have existed at the south.

The tufa deposits of the lake basin are designated in the order of their age, lithoid, thinolithic and dendritic; these minerals are well represented in the plates. The tufa domes of Pyramid lake are well depicted in Pl. VII, which, with Pls. VIII and IX, were kindly loaned by the director of the survey. A general idea of the lake beds in the Humboldt valley is conveyed in Pl. IX. From the study of the terraces and tufa deposits of Lake Lahontan, it appears that the lake had two periods of high water, separated by a time when its basin was even more thoroughly desiccated than it is now, and followed by the present period of dryness. When the lake reached its second high-water stage it was inhabited by fresh-water gastropods and bivalves, and it must have attained a certain degree of freshness, but Mr. Russell adds, since modern lakes, such as Pyramid and Walker, with a degree of salinity distinctly perceptible to the taste, are now inhabited by similar gastropods, it is not necessary to assign to Lahontan, at that stage, a high degree of freshness.

Nearly all the valleys which combine to form the basin of Lake Lahontan are due to profound fractures, the displacements in numerous instances extending 4000 or 5000 feet. These movements are thought to be still in progress, the mountains throughout the Great basin either slowly rising or sinking. "As a matter of observation we find the evidence of recent faulting best defined along the bases of the highest of the ranges, indicating that these owe their distinction to the fact that they are still growing."

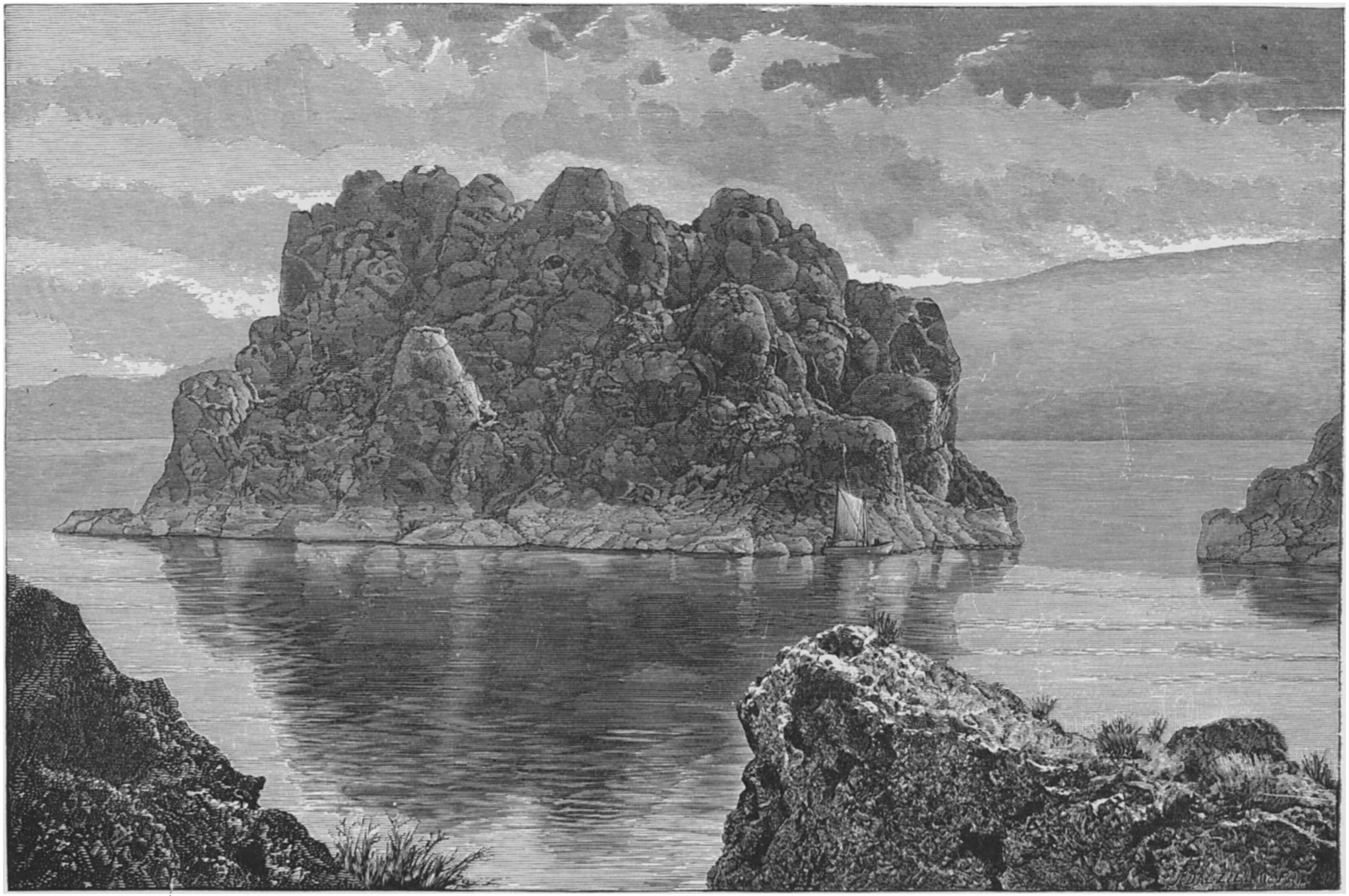
An important contribution to glacial geology is Thos. C. Chamberlin's preliminary account of the terminal moraine of the second geological epoch, illustrated by excellent maps and views. This second great terminal moraine marks a general advance of the great ice-sheet at a date considerably later than the stage of greatest glaciation. The great terminal moraines of the first glacial epoch have been traced from Cape Cod to Ohio and Illinois, but in the interior of the continent this "supposed extreme outer moraine has not been traced out." The author believes that the western portion of what was supposed to be the great terminal moraine of the first epoch is, in Michigan, Wisconsin, Minnesota and Iowa, a part of the later moraine.

HYATT ON THE GENERA OF FOSSIL CEPHALOPODS.—This is an elaborate discussion of the character and relations of the genera of fossil Cephalopods, the results of many years' patient study. It appears in the Proceedings of the Boston Society of Natural History, and is preliminary to a monograph which will appear in the Memoirs of the Museum of Comparative Zoölogy, at Cambridge, Mass.

Univalve shells, the author remarks, may be generally spoken of as cones, which may be either straight, curved or coiled. The larger number of the more ancient shelled cephalopods are straight cones. The young of nautilian shells are identical with the adults of the curved (arcuate) and coiled (gyroceran) and in different series repeat their forms, sutures, shell markings and the outlines of their whorl in transverse section. "They are in succession first arcuate, then gyroceran, and lastly nautilian or close-coiled. In several series genetic lines of adult forms may be followed, which lead by gradation from arcuate, cyrtoceran forms to close-coiled nautilian-shells, the whole showing a connected series of transitions in the form and outline of section, sutures, structure and position of siphon, and shell ornaments and apertures. In some cases these graded series are in accord with the chronological record, the straight appearing first, the arcuate either in company with them or later in time, and the gyroceran and nautilian latest."

The author adds that we cannot of course claim that such perfect evidence has been found even in the larger number of series.

PLATE VII.



Tufa Domes—Shore of Pyramid Lake.